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EXAMINER

HAMO, PATRICK

ART UNIT

PAPER NUMBER

3746

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Please find below and/or attached an Office communication concerning this application or proceeding.



## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities: the term “direct current air supply”, used in a number of references throughout the specification, is used contrary to its ordinary meaning. The written description must clearly define the term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine the claim term.

For examination purposes, the examiner has taken the term “direct current air supply” to mean “direct current power supply”.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Where applicant uses a term of a claim contrary to its ordinary meaning, the written description must clearly define the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term “direct current air supply” in claim 1 seems to be used by the claim to mean “direct current power supply”, though it is unclear as to what is meant to be encompassed by the phrase

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“direct current air supply” in the claim. The term is further indefinite because the specification does not clearly redefine the term.

For examination purposes, the examiner has taken the term “direct current air supply” to mean “direct current power supply” in claim 1 and all other claims dependent therefrom.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 3, 4, 5, 6, 7, 8, 14, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Montgomery 6,435,076 in view of Chang 6,146,101 and Molina 5,742,147.

Montgomery discloses the invention substantially as claimed including an air storage device (12); an actuating device (82) connected to the air storage device to produce a compressed air and to push the compressed air into the air storage device (column 3, lines 16-18); a flywheel-pulley combination connected to a motor shaft constituting a reduction device, shown in figure 2, connected to the actuating device to produce a predetermined torque to operate the actuating device (column 2, lines 50-53); a motor (28) connected to the reduction device to operate the reduction device, where the motor is substantially small enough to be called a “miniature” motor in the broadest

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reasonable interpretation of the term; a housing (22), wherein the main body is mounted in the housing; the housing including a base (40) for supporting the main body; the housing further including a cover pivotally mounted on the base to encompass the main body (column 5, lines 55-67); a handle (18) mounted on the base of the housing (column 5, lines 53-55); the air compressor being portable (16); the air storage device being connected to an air outlet pipe to introduce the compressed air outward (column 1, lines 27-28).

Montgomery does not include a control circuit connected to the motor and the air storage device to detect a pressure contained in the air storage device and to control operation of the motor according to the detected pressure of the air storage device; a direct current power supply connected to the control circuit to supply an electric power to the control circuit; the control circuit being an electronic control circuit; the control circuit including a first pressure detection unit to detect the pressure contained in the air storage device; the control circuit locking the air compressor automatically when the pressure contained in the air storage device is greater than a predetermined value, so that the air compressor stops operating.

However, Chang teaches an automatic control device for a compressor including an electronic controller (30) connected via a microswitch (31) and pressure detection system (column 2, lines 36-44) to an air tank (10) and via an electromagnetic switch (32) to a motor (16) operating an actuation device (15, 18) that delivers compressed air to the tank for the purpose of switching the air compressor between two modes—one suited for reducing energy waste, the other for avoiding damage from over-heating.

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Chang teaches an auto-stop/start mode wherein the pressure detection system disables the pump of air into the air tank when the air pressure in the tank reaches a preset high value (column 2, lines 61-65) in order to lower the waste of energy.

Furthermore, Molina teaches a DC powered compressor system that uses 12 volt batteries (figures 1 and 3) for the purpose of making the system readily portable and independent of electrical outlets, 12 volts being particularly advantageous for their compatibility with automobile charging systems for off-the-grid charging. The power supply is part of an electronic circuit (figure 1) including a pressure sensor that switches the circuit open when the pressure reaches a first preset value and closed when the pressure falls below a second preset value.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified Montgomery's invention with those of Chang and Molina in order to make the portable compressor system more energy efficient and to prevent motor wear with the use of a pressure detection system as described by Chang, and to power the system, including the control circuit, with 12 volt batteries to make the system independent of electrical outlets and readily rechargeable via an automobile's charging system, as described by Molina.

5. Claims 9, 10, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above in view of Chou 6,213,725.

The references as applied to claim 1 above disclose all the limitations substantially as claimed including the air storage device being connected to the piston

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(Montgomery, column 3, lines 16-18). The references as applied to claim 1 do not disclose the reduction device being mounted on the motor and including a drive gear mounted on and rotated by a rotation shaft of the motor and a driven gear meshing with the drive gear; the driven gear of the reduction device having a tooth number greater than that of the drive gear of the reduction device; the actuating device being mounted on the reduction device and including a crank shaft mounted on and driven by the driven gear of the reduction device and a piston mounted on and driven by the crank shaft; the air storage device being connected to the piston.

However Chou teaches a compressor with an improved sealing ring for the piston for the purpose of reducing damage to the piston. Chou's invention includes a housing slidably receiving a piston (4) and a gear (16) driven by a motor (15) driving another, larger gear with more teeth (22, as shown in figure 3), thereby reducing the speed of the motor and translating the motor's rotational energy to the piston via a crankshaft (20) and rod (44), the piston compressing air to an outlet tube (18).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the references as applied to claim 1 above with Chou's invention to reduce damage to the piston in an air compressor system.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 11 above in view of Harvey et al. 4,389,166.

The references as applied to claim 11 above disclose all the limitations substantially as claimed except for the main body including a pressure regulating device

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mounted between an air inlet pipe of the main body and the piston to regulate the pressure contained in the air storage device.

However Harvey teaches a lightweight, miniaturized, portable air compressor including a valve (42) positioned where the air inlet opening (39) meets the piston (32) to regulate the intake of air prior to compression (column 6, lines 50-60). This valve is part of a two-valve system at the inlet and outlet of the piston to prevent air from a storage tank entering the tank during the intake step of the piston, and from atmospheric air entering the piston during the compression step to ensure that the piston runs efficiently.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the references as applied to claim 11 above with Harvey's invention to regulate the air intake and compression of the piston, ensuring the piston runs efficiently.

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 14 above in view of Aoki 5,658,131.

The references as applied to claim 14 above disclose all the limitations substantially as claimed except for the control circuit including a second pressure detection unit to doubly detect the pressure contained in the air storage device.

However Aoki teaches an electric pump control system, comprising an electric pump, an accumulator connected to the electric pump, a first pressure detecting means for detecting a pressure in the accumulator, a second pressure detecting means for detecting a pressure in the accumulator, and two drive circuits for controlling the pump



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based on the output signals from the pressure detecting means (column 1, lines 47-58).

The first pressure detecting means outputs its signal to the first drive circuit, which is capable of directly driving and stopping the electric pump, while the second pressure detecting means outputs its signal to the second drive circuit, which is also capable of directly driving and stopping the pump. The timing of driving and stopping the pump by the second pump is different from the timing of the first drive circuit, thereby providing a time for which the pump is driven only by the first circuit and a time for which the pump is driven only by the second circuit, so that a problem with either pressure detecting means can be detected during the time in which its output to the drive circuit is directly driving the pump (column 1, line 59—column 2, line 8).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the references as applied to claim 14 with Aoki's invention to doubly detect the pressure in the storage tank with two pressure detecting means and safeguard these means by having each one's output drive the pump directly at different times so that a problem in either one could be detected and corrected.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above in view of Namai 6,456,508.

The references as applied to claim 1 above disclose all the limitations substantially as claimed except for the control circuit including a voltage detection unit to detect the electric power of the direct current air supply.

However Namai teaches a drive apparatus for a compressor that can cope with DC voltages of 12V and 24V and can detect a drop in the power source voltage

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regardless of the input voltage (column 3, lines 10-15). This drive apparatus includes a DC power supply comprising a first power supply including a DC/DC converter for converting direct currents from a battery to direct currents of a different voltage and a second power supply including an AC/DC converter for converting commercial AC power sources to DC, and a circuit that switches between the two power supplies within the main DC power supply when it detects a voltage from the power supplies (column 3, lines 27-44), so that the compressor can be either battery-powered or plugged in to a commercial AC power source and function the same in either case.

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the references as applied to claim 1 above with Namai's invention to make the compressor apparatus more portable by allowing it to be either battery-powered or usable with a commercial AC power supply via a control circuit that detects a voltage from either source and shuts off the other.

### ***Conclusion***

9. Applicant is duly reminded that a complete response must satisfy the requirements of 37 C.F. R. 1.111, including: "The reply must present arguments pointing out the specific distinctions believed to render the claims, including any newly presented claims, patentable over any applied references. A general allegation that the claims 'define a patentable invention' without specifically pointing out how the language of the claims patentably distinguishes them from the references does not comply with the requirements of this section. Moreover, 'The prompt development of a clear Issue

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requires that the replies of the applicant meet the objections to and rejections of the claims." Applicant should also specifically point out the support for any amendments made to the disclosure. See MPEP 2163.06 II(A), MPEP 2163.06 and MPEP 714.02. The "disclosure" includes the claims, the specification and the drawings.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Hamo whose telephone number is 571-272-3492. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Stashick can be reached on 571-272-4561. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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